Seeing is Believing:

Can a Naturalistic Visual Scanning Approach to Selective Attention in Anorexia Nervosa Help with Diagnosis?

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Declaration of Conflict of Interest

In the past 12 months, I have no relevant financial relationships with the manufacturers of any commercial products and/or providers of commercial services discussed in this presentation.

Background

- Diagnosis of EDs in children/ adolescents:
  - May be difficult to Identify AN
    - Children with ED maintain their weight/lose a small amount of weight
    - Children and younger adolescents may not have reached menarche
  - Patient may resist treatment
    - Will try to hide their symptoms
    - May minimize or lie about their symptoms
  - Restriction without weight and shape concerns?
  - No biological test/marker for AN

Background

- Attentional bias
  - The tendency for emotionally dominant stimuli to preferentially draw/hold attention.
  - Occurs early in the information-processing sequence
  - Independent of awareness or intent
  - Stroop test & dot-probe test are traditional but indirect measuring methods
- Current study measures visual scanning behaviour constantly to measure attentional bias

Visual scanning behavior

- Measures can include:
  - total fixation time
  - average glance duration on images of a particular theme.
- Unique patterns in other MH diagnoses:
  - Depressive disorders:
    - Subjects spend significantly more time looking at images with dysphoric themes (average glance duration)

(Eizenman et al, 2003)
  - Anxiety disorders:
    - Subjects display an attentional bias for threatening images

(MacLeod,1986; Mogg et al., 2000)

Visual scanning behavior

- In EDs
  - Patients with AN spent equal amts. of time looking at food images and not food images, while healthy restricting controls looked longer at food pictures.

(Giel at al., 2011a)
  - Subjects, who are dissatisfied with their weight or shape focused on the ugly parts of themselves & the most attractive parts of others while participants who are satisfied with their bodies looked & concentrated on the self-identified ugly parts of others.

(Jansen et al, 2004)
  - Large variability between patients and the overlap between the parameters of patients and controls does not yet allow for robust detection of attentional biases in AN.

Purpose

- To explore the use VSB to test attention bias to weight/shape images in female patients aged 12-18 with AN compared to controls (who are drawn to social images).
  - Images of thin people or body parts
  - Images of fat people or body parts
  - Both thin and fat images

Methods

- completed the EAT-26.
- Subjects viewed four competing images (fat and/or thin body images, and social or neutral images) presented simultaneously on a computer screen
- The primary outcome measure was relative time spent viewing the image.
- Both T-tests and chi-square analyses were performed.
- Log likelihood processor to attempt to differentiate patients from controls

Remote Point-of-Gaze Estimation

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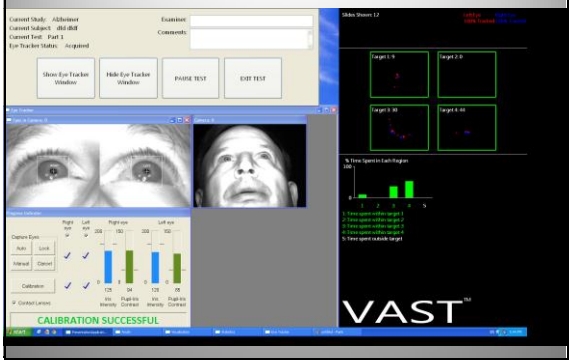


Results

- 13 cases and 20 controls recruited
- The mean age was 14.5 ± 1.72 years (no sig. difference between cases & controls)

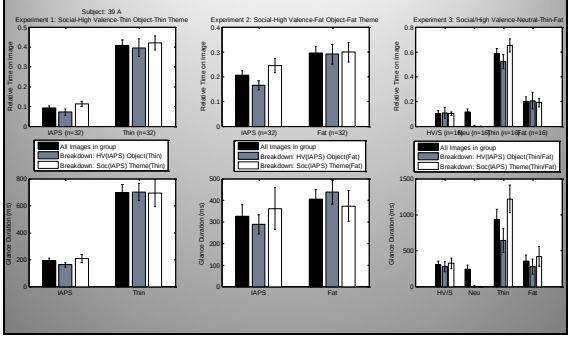
EAT-26 Score		N	Mean	SD	Significance
Dieting subscale	control	20	3.35	2.852	0.001
	case	13	20.62	13.629	
Bulimia subscale	control	20	.25	0.786	0.000
	case	13	6.23	4.567	
Oral control subscale	control	20	2.90	3.259	0.000
	case	13	11.15	5.367	
EAT-26 Total score	control	20	6.50	5.615	0.000
	case	13	38.00	22.316	

* Four cases scored below the clinical cutpoint of 20 on the EAT
** All 20 controls scored below the clinical cutpoint of 20 on the EAT

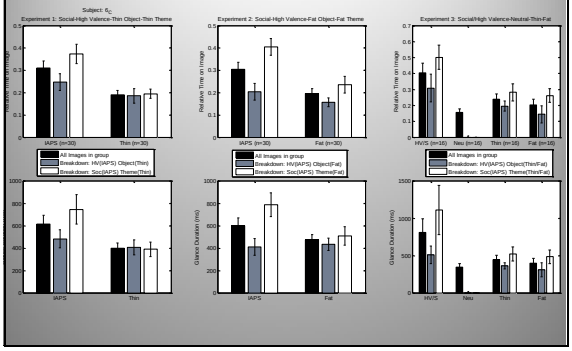
Results

- 100% of patients had a viewing preference for thin body images v.s. 30% of controls ($p<0.001$)
- 8/12 (67%) patients and only 3/17 (18%) controls had a viewing preference for fat body images ($p<0.05$).

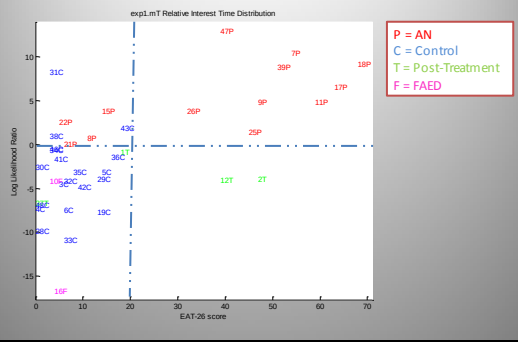
Example Participants - AN



Example Participants - Control



Likelihood Ratio Detector



Example Participants - Control

Example Participants - AN

Conclusions

- Preoccupation with shape & weight increased attention bias towards thin images for AN patients compared to controls.
- Measuring the VSB biases associated with increased interest in images with thin body shapes and decreased interest in images with social interactions can achieve both high sensitivity and high specificity in detecting AN.
  - even when symptoms are minimized or misrepresented.
- This study is a step in developing a non-volitional tool to objectively and reliably measure presence of AN.

Caveats

- Pilot study
- Small sample size
- Select population
- Needs Replication
- VSB patterns to other images (e.g. foods)
- What about BN, EDNOS, Recovered pts?

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